REMARKS:

Status of claims and amendments

Claims 1-10 are pending in the application. In the Office Action dated May 18, 2006, the Examiner:

1. rejected claims 1-2 under 35 U.S.C. 102(b) as being anticipated by Miller;
2. rejected claims 3-4, 7-10 under 35 U.S.C. 103(a) as being unpatentable over Miller; and
3. rejected claims 5-6 under 35 U.S.C. 103(a) as being unpatentable over Miller in view of Kwon.

These rejections are respectfully traversed in light of the instant amendments.

In this amendment, claim 1 has been amended to include the subject matter of original claim 3. Claims 3 and 4 have been canceled. Claims 5 and 6 have been amended to be consistent with the cancellation of claims 3 and 4, from which they previously depended. No new matter is added.

The 103(a) rejection of original claim 3, amended claim 1

The Examiner stated that

> Miller does not disclose the static electricity shielding circuit....However, shielding an electronic component from the environment in order to prevent undesirable radiation from the electronic components such as RF-radiation (Radio Frequency radiation) is well known and would have been obvious.

However, the Examiner has not addressed the limitation of a static electricity shielding circuit.

Let us assume, for the sake of argument only, that it would have been obvious to shield Miller's transmitter from RF-radiation. One skilled in the art thus would have enclosed Miller's transmitter with a conducting material. Please see the attached articles from Wikipedia, http://en.wikipedia.org/wiki/RF_shielding and http://en.wikipedia.org/wiki/Electromagnetic_shielding, the former of which states, among other things: "RF shielding is the protection of sensitive electrical equipment from external radiofrequency (RF) electromagnetic radiation by <u>enclosing it in a conducting material</u>....The enclosure may be made of an unbroken conducting sheet...or a wire mesh." (http://en.wikipedia.org/wiki/RF_shielding, page 1, emphasis added).

There is simply no motivation to provide Miller's transmitter with a static electricity shielding circuit, nor for shielding transmission of static electricity from the metallic blade portion to the transmitter module. Claim 1, as well as its dependents, claims 2 and 5-10, are thus patentable over Miller.

Conclusions

In view of the foregoing, Applicant believes all claims now pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance is respectfully requested.

Authorization is granted to charge any outstanding fees due at this time for the continued prosecution of this matter to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (matter no. 060944-0198).

Respectfully submitted,

August 16, 2006

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Date

for

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RF shielding

From Wikipedia, the free encyclopedia

It has been suggested that this article or section be merged into *electromagnetic shielding*. (Discuss)

RF shielding is the protection of sensitive electrical equipment from external radiofrequency (RF) electromagnetic radiation by enclosing it in a conducting material. RF shielding is a refinement of the principle of the Faraday cage, which protects equipment from electric fields such as those from electrostatic discharges.

The enclosure may be made of an unbroken conducting sheet, like the metal box surrounding a sensitive radio receiver, or a wire mesh, like that in the door of a microwave oven. Any holes in the box or mesh must be significantly smaller than the wavelength of the radiation that is being kept out, or the enclosure will not effectively approximate an unbroken conducting surface.

How RF shielding works

Electromagnetic radiation consists of coupled electric and magnetic fields. The electric field produces forces on the charge carriers (i.e., electrons) within the conductor. As soon as an electric field is applied to the surface of an ideal conductor, it generates a current that causes displacement of charge inside the conductor that cancels the applied field inside.

Similarly, *varying* magnetic fields generate current vortices that act to cancel the applied magnetic field. (The conductor does not respond to static magnetic fields, so static magnetic fields can penetrate the conductor freely.) The result is that electromagnetic radiation is reflected from the surface of the conductor: internal fields stay inside, and external fields stay outside.

Several factors serve to limit the shielding capability of real RF shields. One is that, due to the electrical resistance of the conductor, the excited field does not completely cancel the incident field. Also, most conductors exhibit a ferromagnetic response to low-frequency magnetic fields, so that such fields are not fully attenuated by the conductor. Any holes in the shield force current to flow around them, so that fields passing through the holes do not excite opposing electromagnetic fields. These effects reduce the field-reflecting capability of the shield.

In case of high-frequency electromagnetic radiation the time the above-mentioned adjustments take is not negligible, but then the radiation energy, as far as it is not reflected, is absorbed by the skin (unless it is extremely thin), so in that case there is no electromagnetic field inside either. This is called the skin effect. A measure for the depth to which radiation can penetrate the shield is the so-called skin depth.

See also

- Electromagnetic shielding

Retrieved from "http://en.wikipedia.org/wiki/RF_shielding"

Categories: Articles to be merged | Radio electronics

- This page was last modified 22:46, 11 June 2006.

Electromagnetic shielding

From Wikipedia, the free encyclopedia

It has been suggested that *RF shielding* be merged into this article or section. (Discuss)

Electromagnetic shielding is the process of limiting the coupling of an electromagnetic field between two locations. Typically it is applied to enclosures, separating electrical content from the 'outside world', and to cables, separating internal wires from the environment the cable runs through.

The shielding is achieved using a conductive material as a barrier. Typical materials include sheet metal, metal mesh, ionized gas, plasma and aluminum foil. Another commonly used shielding method, especially with electronic goods housed in plastic enclosures, is to coat the inside of the enclosure with a metallic ink or similar material. The ink consists of a carrier material loaded with a suitable metal, typically copper or nickel, in the form of very small particulates. It is sprayed on to the enclosure and, once dry, produces a continuous conductive layer of metal, which can be electrically connected to the chassis ground of the equipment, thus providing effective shielding.

The shielding can reduce the coupling of radio waves, visible light, electromagnetic fields and electrostatic fields. The amount of reduction depends very much upon the material used, the method of connection of the shield (or *screen*) and the frequency of the fields of interest.

One example is a shielded cable, which has electromagnetic shielding in the form of a wire mesh surrounding an inner core conductor. The shielding impedes the escape of any signal from the core conductor, and also signals from being added to the core conductor.

Some cables have two separate concentric screens, one connected at both ends, the other at one end only, to maximise shielding of both electromagnetic and electrostatic fields.

See also

- Electromagnetic radiation
- Electromagnetic interference
- Electromagnetic radiation hazard
- Radiation
- Ionising radiation protection
- Mu-metal
- Faraday cage
- RF shielding
- Tin-foil hat
- Electric field screening

External links

- Shielding and Guarding (http://www.analog.com/UploadedFiles/Application_Notes/41727248AN_347.pdf) (PDF) — Analog Devices Application Note
- Grounding and Shielding Audio Devices (http://www.rane.com/note151.html) — RaneNote

Retrieved from "http://en.wikipedia.org/wiki/Electromagnetic_shielding"

Categories: Articles to be merged | Electronics | Magnetoencephalography

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